Defense Information Systems Agency

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Agile Development at the DoD

SoftwareForge Document ID – doc16436

Forge.mil Engineering

August 2011

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Agenda

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- The State of Software Development
- Agile as a Solution
- Forge.mil Tailored Agile Practices
- Questions & Answers

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The New Mission

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"Software code has become central to how the war-fighter is able to conduct missions... DoD must pursue an active strategy to manage its software knowledge base and foster an internal culture of open interfaces, modularity, collaboration, and reuse."

- Open Technology Development Roadmap Plan (April 2006)
- Commissioned by Sue Payton, Asst. Sec for Air Force Acquisition

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Changing Policy & Guidance

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HR 2647, National Defense Authorization Act for Fiscal Year 2010, Sec. 804.

"The Secretary of Defense shall develop and implement a new acquisition process for information technology systems. The acquisition process developed and implemented pursuant to this subsection shall, to the extent determined appropriate by the Secretary —

. . . be based on the recommendations in chapter 6 of the March 2009 report of the Defense Science Board Task Force on Department of Defense Policies and Procedures for the Acquisition of Information Technology; and

. . . be designed to include —

1. ***early and continual involvement of the user;***
2. ***multiple, rapidly executed increments or releases of capability;***
3. ***early, successive prototyping to support an evolutionary approach; and***
4. ***a modular, open-systems approach.***

Are we involving the End User?

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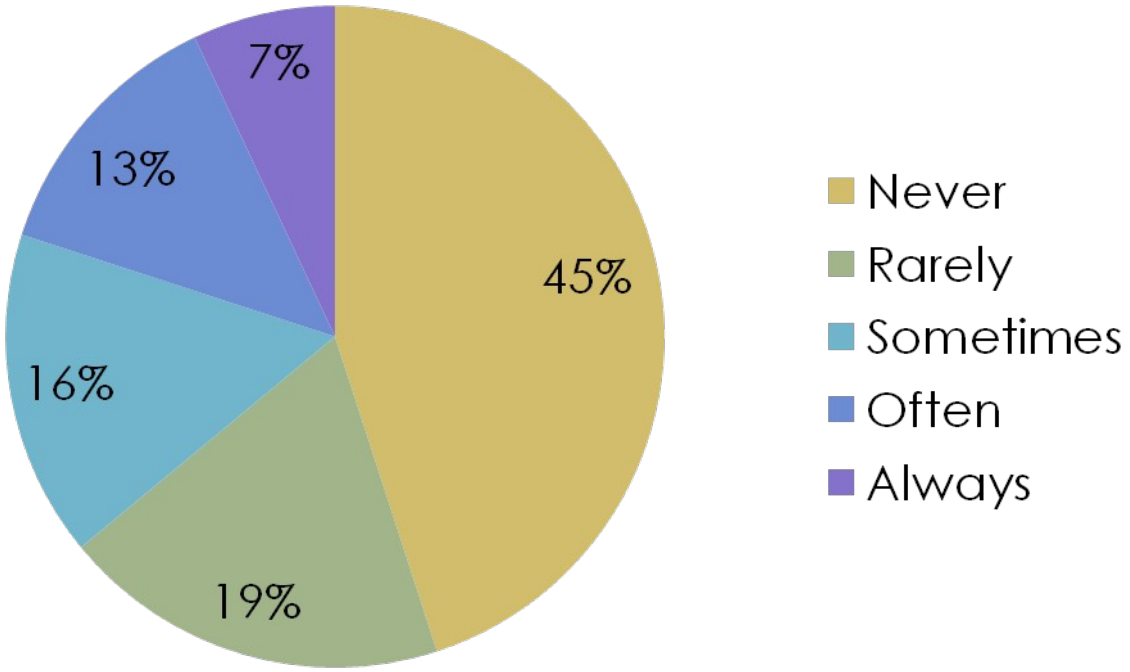
Rates of Feature Usage in Software Projects:



Always or Often Used
20%

Rarely or Never Used
64%

Standish Group Study

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Are We Delivering Quickly?

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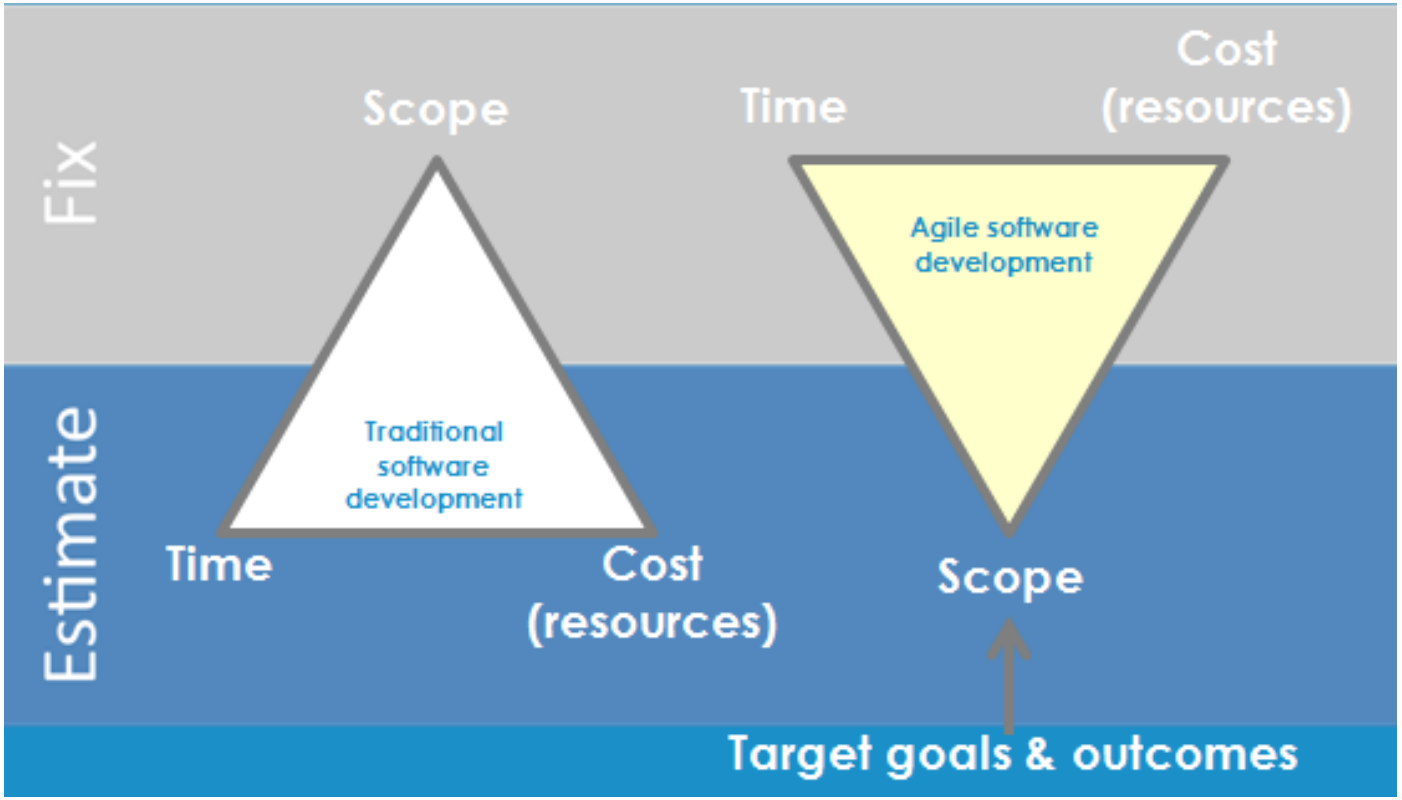
Conventional projects take too long and often miss the mark

Lean (agile) methods link developers and users to hit the mark quickly



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Are We Delivering Incrementally?

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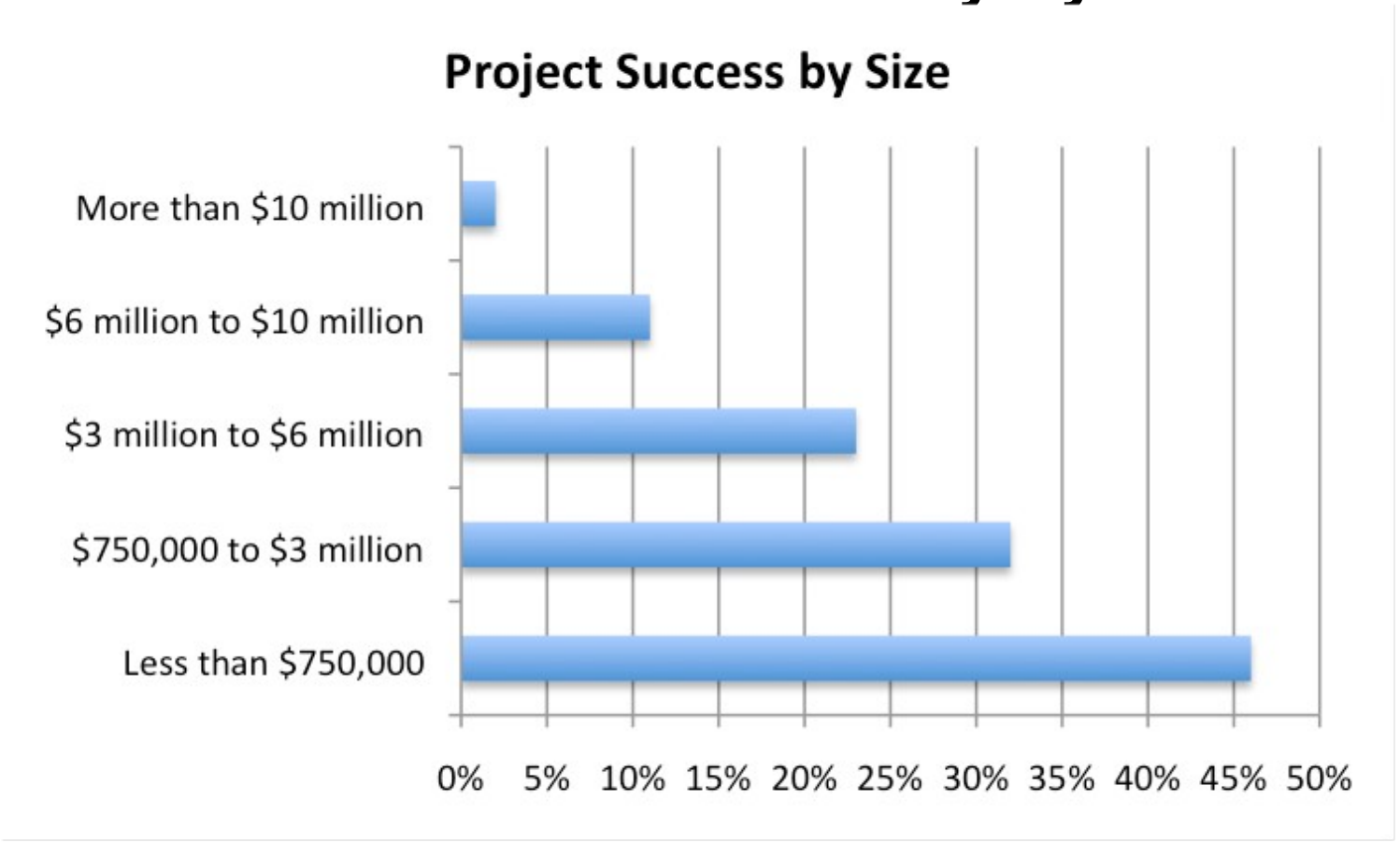
Successful Delivery by



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Are We Delivering At All?

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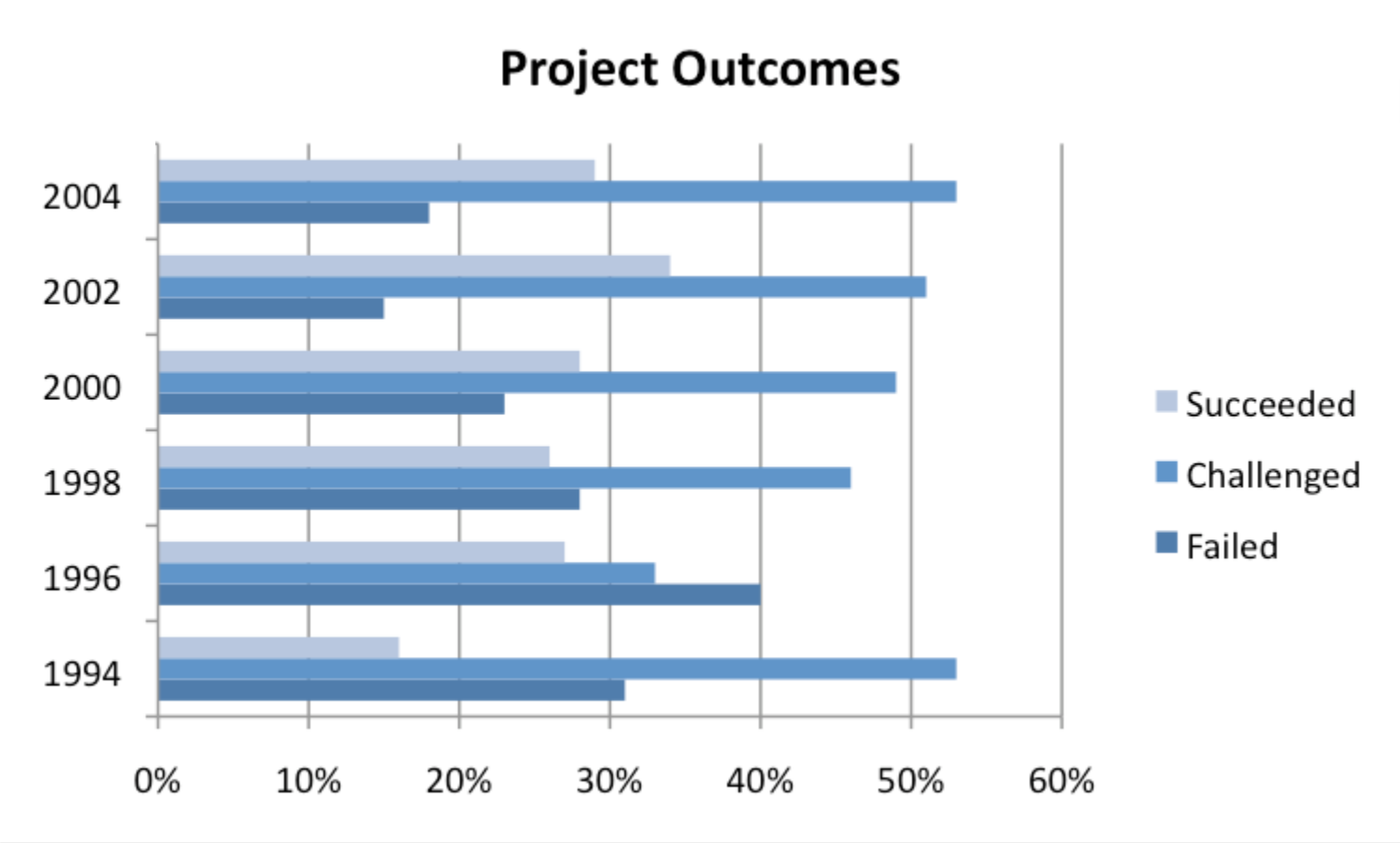
Delivery on U.S. Software Projects



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Agile As A Possible Solution

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Agile principles include:

- **Focus on Customer Value –** Align project, product and team visions to deliver better product quality – faster and cheaper.
- **Small Batches -** Create a flow of value to customers by "chunking" feature delivery into small increments.
- **Small, Integrated Teams -** Intense collaboration via face-to-face communication, collocation, etc; diversified roles on integrated, self-organizing, self-disciplined teams.
- **Small, Continuous Improvements –** Teams reflect, learn and adapt to change; work informs the plan.

Delivering Customer Value with Agile Project Management

The right product, at the right time, for the right price.

•Higher Quality: "Designed-to-fit" product with flexibility to change.

•Increased Throughput: Iterative and incremental project and product "chunks" with earlier value delivery.

•Reduced Waste: Lean, efficient processes with lower costs and higher productivity.

Agile = Family of Methodologies

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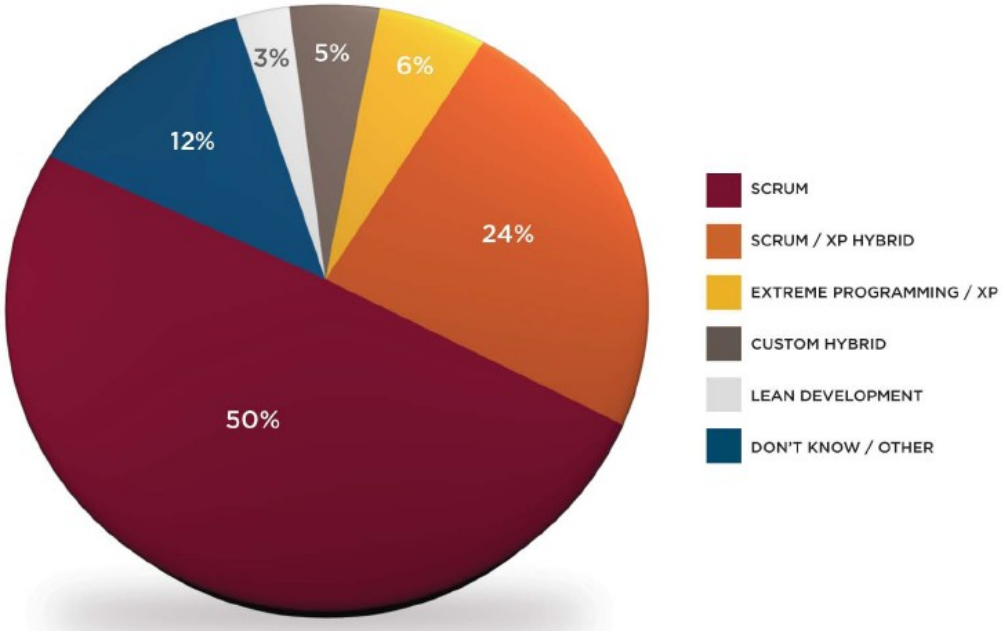
- Extreme Programming
- Lean Software Development
- Feature Driven Development
- Dynamic Systems Development Method
- Agile Unified Process
- SCRUM



Forge.mil employs a SCRUM / XP hybrid methodology

Agile = Early Value

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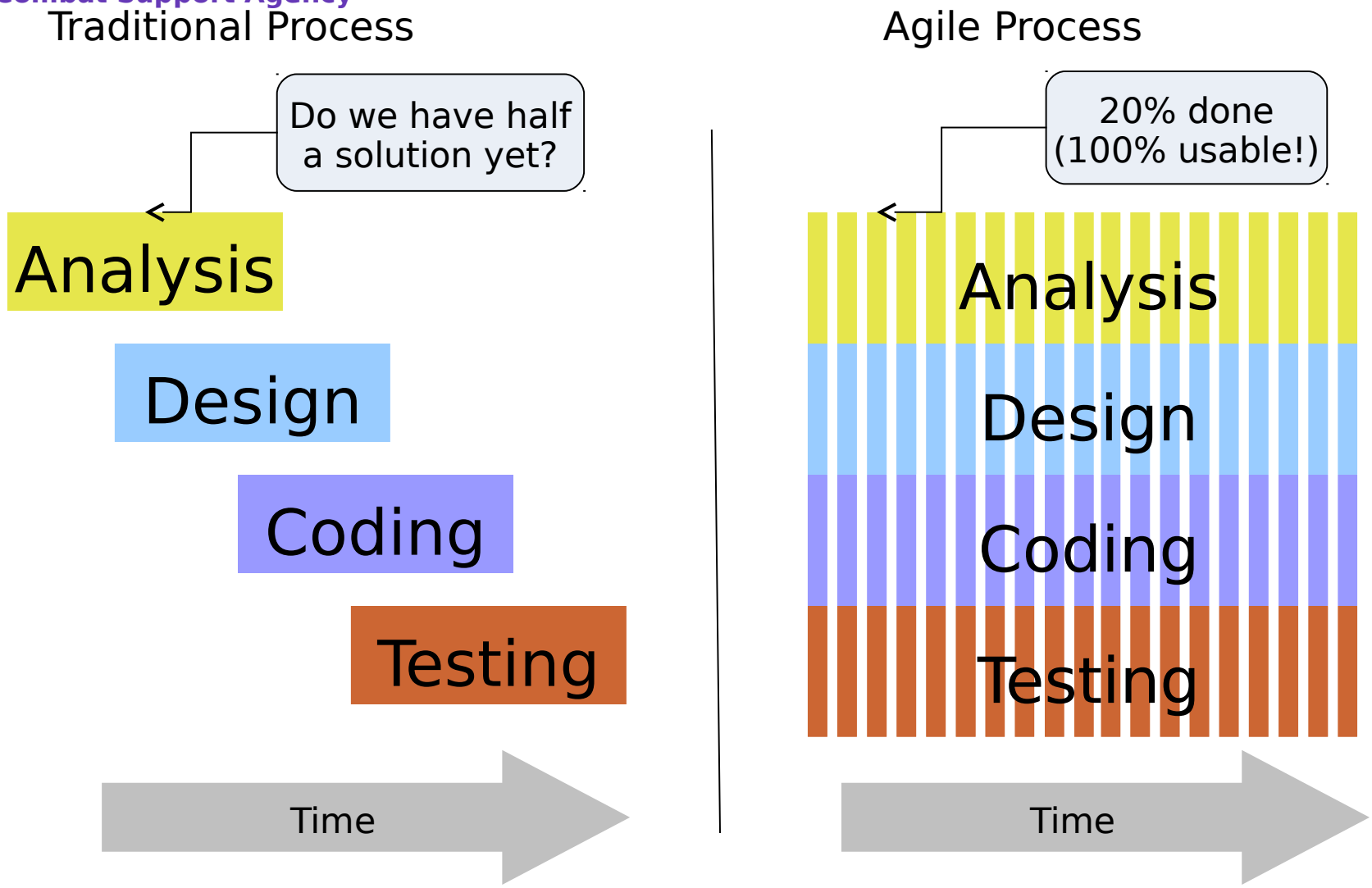

Waterfall Requires Perfect Vision

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Waterfall calls for a fully formed idea up front.

And, doing it on time requires dead accurate estimation.

1 2 3 4 5

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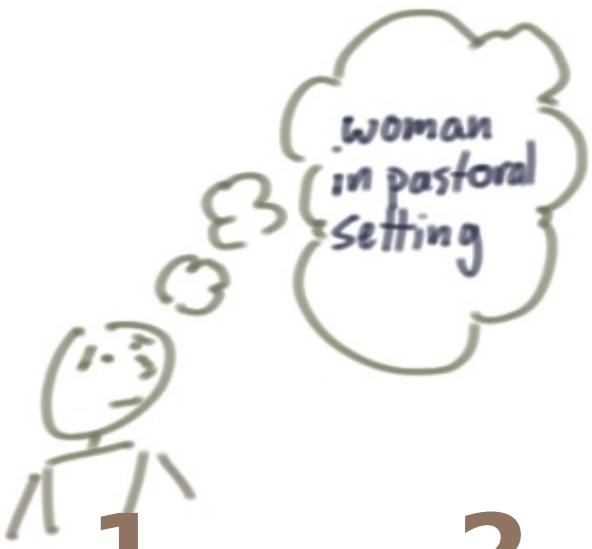
Agile Expects Vision Shift



…builds a rough version, validates it, then slowly builds up quality

A more iterative allows you to move from vague idea to realization making course corrections as you go….stop when diminishing returns are encountered!

1

2

3

4

5

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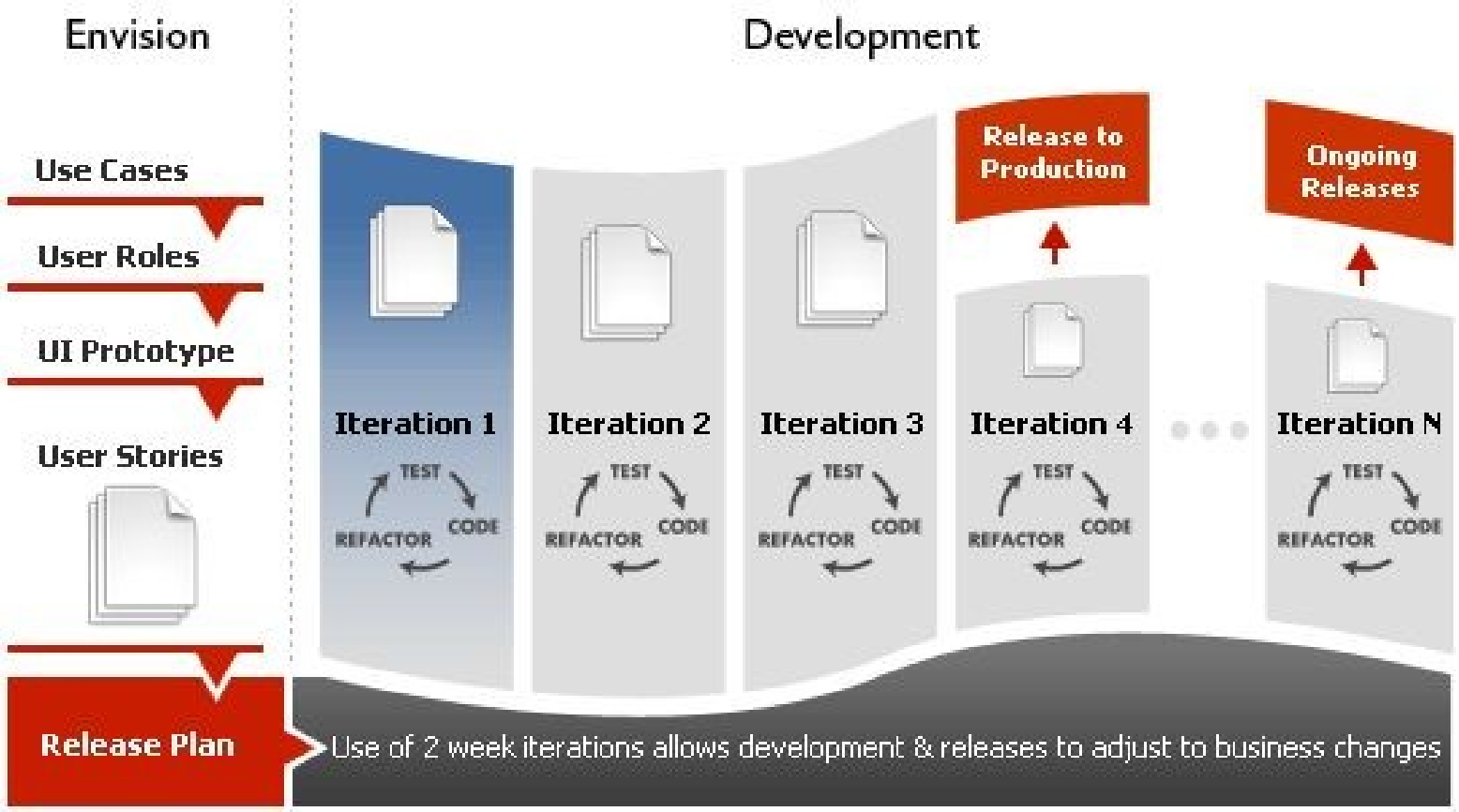
Short Iterations, Small Releases



Cross Functional Teams

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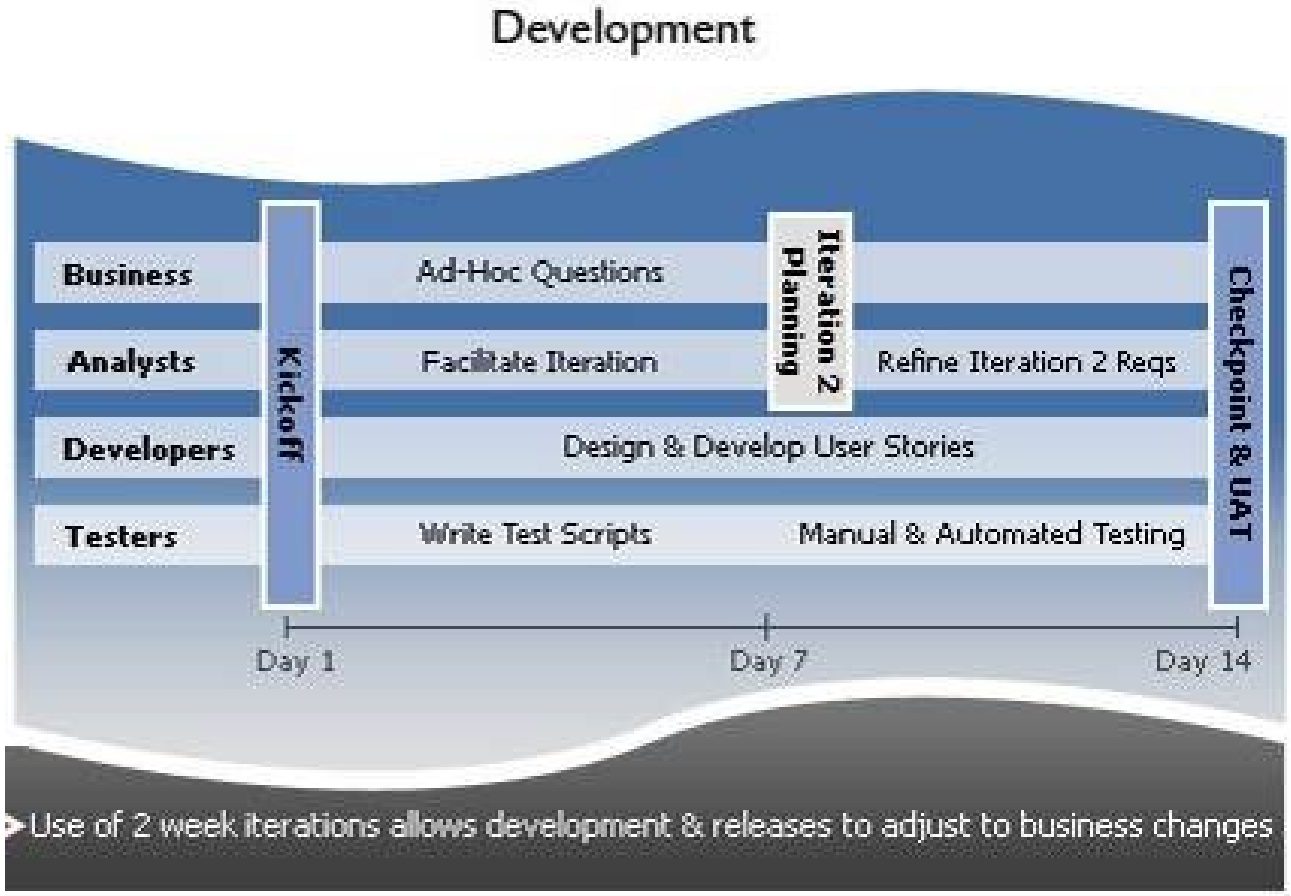

Reliance on Automation

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Manager

Informs

Developers

Commit

Watches

Uses

Version Control
(SVN, CVS, GIT)

Build Integration
(Jenkins, Maven)

Build Scripts
(Ant, Puppet, Bash, PowerShell)

Automated Push

Test 1
(Automated Regression Tests)

Tester

Test

Nightly Pull

Test 2
(Manual & Migration Tests)

Stakeholder

Inspect

On-Demand Pull

Sandbox

- ✓*Compile/Tag Source*
- ✓*Run Unit Tests*
- ✓*Run Functional Tests*
- ✓*Run Test Coverage*
- ✓*Static Code Analysis*
- ✓*Build Database*

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The “Agile Bet”

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THE AGILE BET

If we can make changes cheaply enough, the cost savings from **quicker feedback** and **increased learning** outweigh the costs of *overhead* and *rework*.

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Considering Agile at DoD

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How do we write an agile SOW?

Can we write a cost or affordability rationale under agile?

Do we need an agile coach?

What's the effect on CONOP?

Is it possible to co-locate?

Will testers be allowed to work closely with development?

How do we get access to end users for feedback?

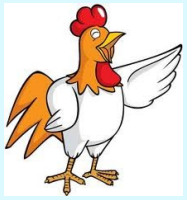
Agile Best Practices

Forge.mil Hybrid Agile Methodology

SCRUM
(Management Framework)

"Soft" Best Practices
- Requirements Backlog
- Sprint Kickoff
- Daily Standup
- Burn-down Chart
- User Acceptance Test

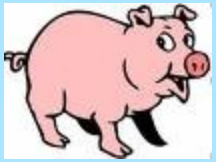
Team Members
- Program Management
- Information Assurance
- Operations
- Business Office



XP
(Development Methodology)

"Hard" Best Practices
- Planning Game
- User Stories
- Test Driven Development
- Continuous Integration
- Continuous Testing

Team Members
- Project Management
- Development
- QA - Test



Procurement / Acquisition

- Procurement
  - Not Aware of any Template Agile RFP or SOW Language
  - Identify required reviews
  - Define type, format and content of documentation to fit agile process
  - Identify constraints from outside teams such as IA or IOP
- Staffing
  - Team composition and interaction changes
  - Co-location of teams or invest in online meeting and collaboration tools
  - Rewrite roles and responsibilities of team members
  - Consider the use of an agile coach on the team

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Planning / “Envision”

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- Best Practices
  - System Metaphor (xp)
  - The Planning Game (xp)
  - Product Backlog (scrum)
- Forge.mil Tweaks
  - Quarterly Release Meetings **(added!)**
  - Flag Features with Security Implications **(added!)**

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Development / Test

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- Best Practices
  - Burn down (scrum)
  - Sprint Backlog (scrum)
  - Sprint Planning (scrum)
  - Daily Standup (scrum/xp)
  - Sprint Review (scrum)
  - Sprint Retrospective (scrum)
  - Simple Design (xp)
  - Continuous Testing (xp)
  - Refactoring (xp)
  - Pair Programming (xp)
  - Collective Code Ownership (xp)
  - 40 Hour Work Week (xp)
- Forge.mil Tweaks
  - Embed IA Representative **(added!)**
  - Continuous Integration – leverage for security scans **(in progress)**
  - Onsite Customer – invest in collaborative tools (DCO, Forge.mil, survey)
  - Coding Standards – leverage CI plug-ins

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Integration / Release

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- Best Practices
  - Small Releases (xp)
  - Frequent Releases (xp)

- Forge.mil Tweaks
  - Fully Automate Application Releases **(added!)**
  - Fully Automate Environment Configuration – O/S, DB, STIG **(added!)**
  - Maintain Release Management Dashboard **(in progress)**

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Questions

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Contact Info

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Email us at community@forge.mil

Follow us on Twitter

Join the Forge.mil Group on milBook

Sign up for Forge.mil updates at

http://www.disa.mil/forge/

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Next Steps

- **Get an account**
  - Navigate to https://community.forge.mil (requires a valid DoD CAC or ECA Certificate).
  - Your account is active once your email address is confirmed.
  - For info on how to obtain and install an ECA Certificate, see the FAQ – "How can I get access to Forge.mil" at https://www.forge.mil.
- **Join the Forge Community Support Group to –**
  - Review the Getting Started Guides
  - View Training, FAQs, and Support Documentation
  - Ask Questions and Submit Enhancement Requests
- **Find, connect and follow other members** – browse users under the People tab
- **Find and join a group** – search the Group Directory in Community
- **Find and join a project** – search the Project Directory in Community or 'All Projects' on SoftwareForge or ProjectForge
- **Visit the Forge.mil Community Home**
  - **Visit the featured group and project**
  - **View the most popular content –** What do other users think you should be reading?
- **Still have questions –** contact the Forge.mil Community Management Team at community@forge.mil

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Forge.mil Track Sessions

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Session	Description	Date/Time	Location
Forge 101 – An Introduction to Forge.mil (Daily Sessions)	Learn how to participate in a growing community of developers, program managers, testers, certifiers, end users and Warfighters and how to make the most of the current capabilities	TBD	TBD
		TBD	TBD
		TBD	TBD
Continuous Delivery: Maximize Velocity and Value! (Daily Sessions)	Hear about the key technologies and techniques utilized by the Forge.mil project team to achieve maximum delivery velocity and "satisfy the customer through early and continuous delivery of valuable software"	TBD	TBD
		TBD	TBD
		TBD	TBD
De-mystifying Agile Software Development.		TBD	TBD
Forge.mil Success Stories and Lessons Learned – Community Case Studies	During this track session, attendees can participate in a lively discussion with the Forge.mil leadership and current Forge.mil customers on how Forge.mil is transforming software development.	TBD	TBD
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Forge.mil Breakout Sessions

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Session	Description	Date/Time	Location
Session 1	Agile Software Development – A Day in the Life of an Agile Development Team	TBD	TBD
Session 2	Forge.mil Power Users Information Exchange	TBD	TBD
Session 3	Technical Exchange – Continuous Integration	TBD	TBD
Session 4	Technical Exchange – Subversion Best Practices	TBD	TBD
Session 5	Technical Exchange – Forge.mil Testing Services	TBD	TBD

Next Steps